Avaya Solution & Interoperability Test Lab

Application Notes for Configuring Firetide HotPort 3103 Wireless Mesh Nodes to Support Avaya VoIP Communication via a Wireless Mesh Network – Issue 1.0

Abstract

These Application Notes describe a compliance-tested configuration comprised of Avaya Communication Manager, Avaya Wireless Telephones, Avaya IP Softphones, and Firetide HotPort 3103 Wireless Mesh Nodes. The Firetide HotPort 3103 Wireless Mesh Nodes can provide a meshed wireless network to support access points from multiple vendors, and provide instant network reachability in the environment where the wired network infrastructure is not available. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

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1. Introduction

These Application Notes describe a compliance-tested configuration comprised of Avaya Communication Manager, Avaya IP Wireless Telephones, Avaya IP Softphones and the Firetide HotPort 3103 Wireless Mesh Nodes. Firetide HotPort 3103 Mesh Nodes were configured to provide an instant meshed wireless network to support Avaya VoIP. Features such as VLAN, 802.1Q tagging and wireless security were tested. Third party Access Points were also tested with HotPort 3103 Wireless Mesh Nodes.

Figure 1 illustrates a sample configuration used for verification.

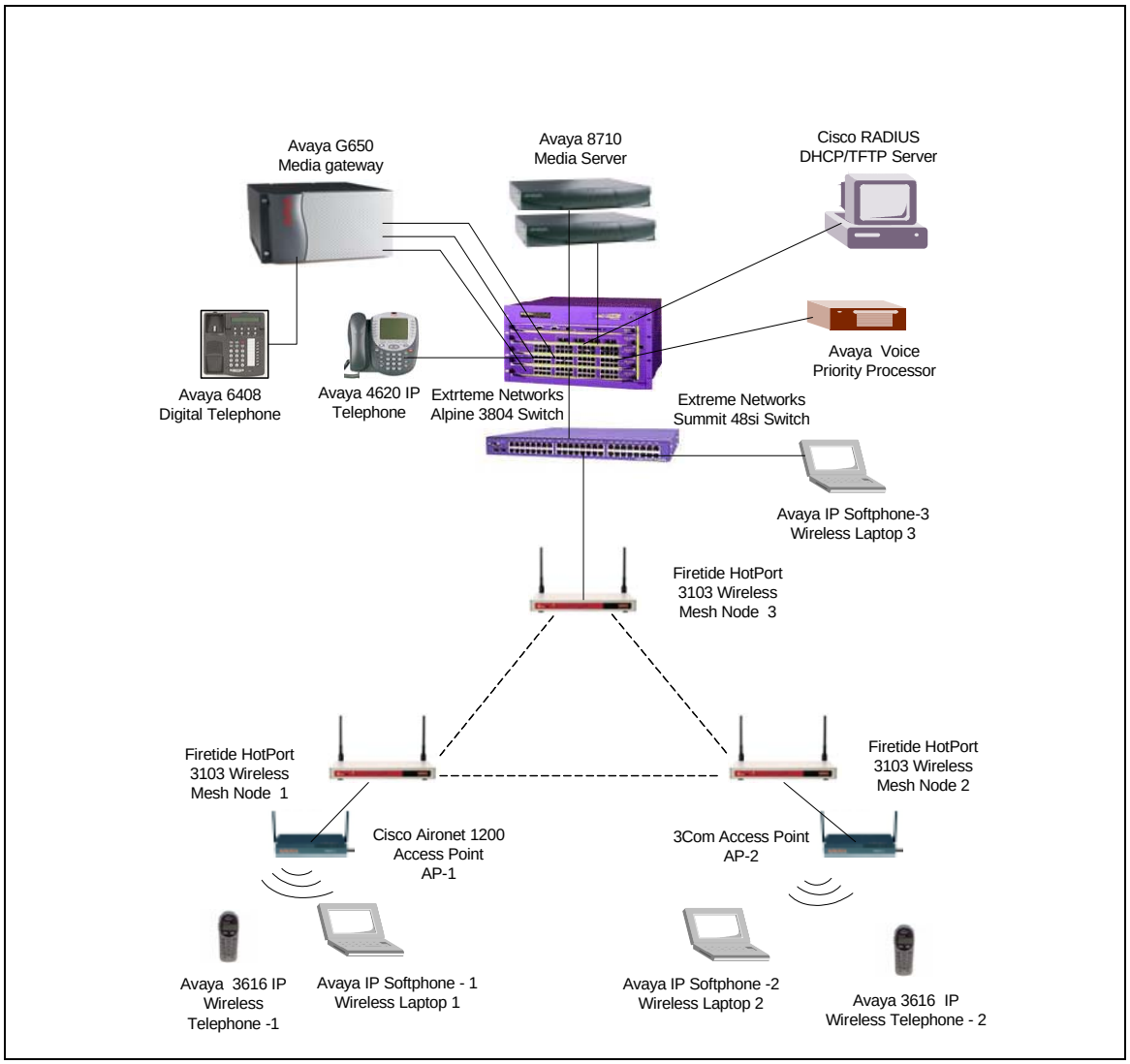

Figure 1: Sample configuration.

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2. Equipment and Software Validated

The following equipment and software/firmware were used for the sample configuration provided:

Device Description	Version
Avaya S8710 Media Server with Avaya G650 Media Gateway	Avaya Communication Manager 3.0 (Load 340.3)
Avaya Voice Priority Processor	R168.112
Avaya 4620 IP Telephones	R2.2.3
Avaya 3616 IP Wireless Telephones	096.040
Avaya IP Softphone	RV 5.2.4.20
Firetide HotPort 3103 Wireless Mesh Nodes	V2.7.0 (build 3619)
Cisco Aironet 1200 (AP1)	IOS 12.2(15) XR2
3Com AP (AP2)	V2.03.13
Extreme Networks Alpine 3804 Switch	V7.2.0 (Build 25)
Extreme Networks Summit 48si Switch	V6.2.2 (Build 68)
Cisco RADIUS/DHCP/TFTP Server	R3.2(2) Build 5

3. Configure Avaya Communication Manager

This section describes the steps for configuring Avaya Communication Manager. Use the **add station 38000** command from the System Access Terminal (SAT) to add an available extension. In this case, extension 38000 is used for Avaya IP Wireless Telephone 1 as shown below.

- Enter **4606** in **Type** field for IP wireless 3616 telephone.
- Enter **IP** in **Port** field.
- Enter **IP Wireless Telephone 1** in **Name** field (optional).
- Enter **N** in **IP SoftPhone** field.
- Leave default for other fields.

```
add station 38000                                          Page   1 of   3
                                  STATION

Extension: 38000                        Lock Messages? n          BCC: 0
     Type: 4606                         Security Code: *           TN: 1
     Port: IP                        Coverage Path 1:             COR: 1
     Name: IP Wireless Telephone 1   Coverage Path 2:             COS: 1
                                     Hunt-to Station:
STATION OPTIONS
             Loss Group: 19          Personalized Ringing Pattern: 1
                                                Message Lamp Ext: 38000
           Speakerphone: 2-way                Mute Button Enabled? y
        Display Language: english
 Survivable GK Node Name:
          Survivable COR: internal                Media Complex Ext:
   Survivable Trunk Dest? y                            IP SoftPhone? N
```

- Enter **enhanced** in the **Multimedia Mode** field.

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- Enter **y** in the **Direct IP-IP Audio connections** and **IP Audio Hairpinning** fields.
- Retain defaults for other fields.

```
add station 38000                                          Page   2 of   3
                                  STATION
FEATURE OPTIONS
           LWC Reception: spe              Auto Select Any Idle Appearance? n
          LWC Activation? y                        Coverage Msg Retrieval? y
  LWC Log External Calls? n                              Auto Answer:
none
             CDR Privacy? n                             Data Restriction? n
   Redirect Notification? y                   Idle Appearance Preference? n
 Per Button Ring Control? n                 Bridged Idle Line Preference? n
   Bridged Call Alerting? n                     Restrict Last Appearance? y
  Active Station Ringing: single          Conf/Trans on Primary Appearance? n

        H.320 Conversion? n          Per Station CPN - Send Calling Number?
       Service Link Mode: as-needed
         Multimedia Mode: enhanced                Audible Message Waiting? n
    MWI Served User Type:                      Display Client Redirection? n
              AUDIX Name:                      Select Last Used Appearance? n
                                                 Coverage After Forwarding? s
                                                   Multimedia Early Answer? n
                                             Direct IP-IP Audio Connections? Y

 Emergency Location Ext: 38000     Always Use? n      IP Audio Hairpinning? y
```

Leave default for all fields.

```
add station 38000                                          Page   3 of   3
                                  STATION
 SITE DATA
       Room:                                              Headset? n
       Jack:                                              Speaker? n
      Cable:                                             Mounting: d
      Floor:                                            Cord Length: 0
   Building:                                              Set Color:

ABBREVIATED DIALING
 List1:                    List2:                     List3:

BUTTON ASSIGNMENTS
 1: call-appr                          4:
 2: call-appr                          5:
 3: call-appr                          6
```

Use the same procedure to add additional stations.

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4. Configure Firetide HotPort 3103 Wireless Mesh Nodes

With an auto discovery protocol, the Firetide HotPort 3103 Wireless Mesh Nodes can find each other and establish a meshed wireless network automatically. The configuration executed in one node can be pushed to all other nodes in the meshed network. The Mesh Nodes support VLAN, 802.1Q tagging, as well as Wired Equivalent Privacy (WEP) and Advanced Encryption Standard (AES) security. Quality of Service (QoS) for VoIP is not supported in the current release.

The Firetide HotView application is used to configure the Mesh Nodes. Configure a PC with an IP address in the same subnet as a Mesh Node. Make sure that the PC can ping the Mesh Node before launching the application. Follow the steps below to configure the Mesh Nodes.

4.1. Assign IP Address and Default Gateway

To manage the wireless meshed network, a management IP address is required to assign to the system. Assume that an IP address of 20.1.1.40 has been assigned. Launch the Firetide HotView application and enter the following information in the proper fields as shown below. Click **Login** when done.

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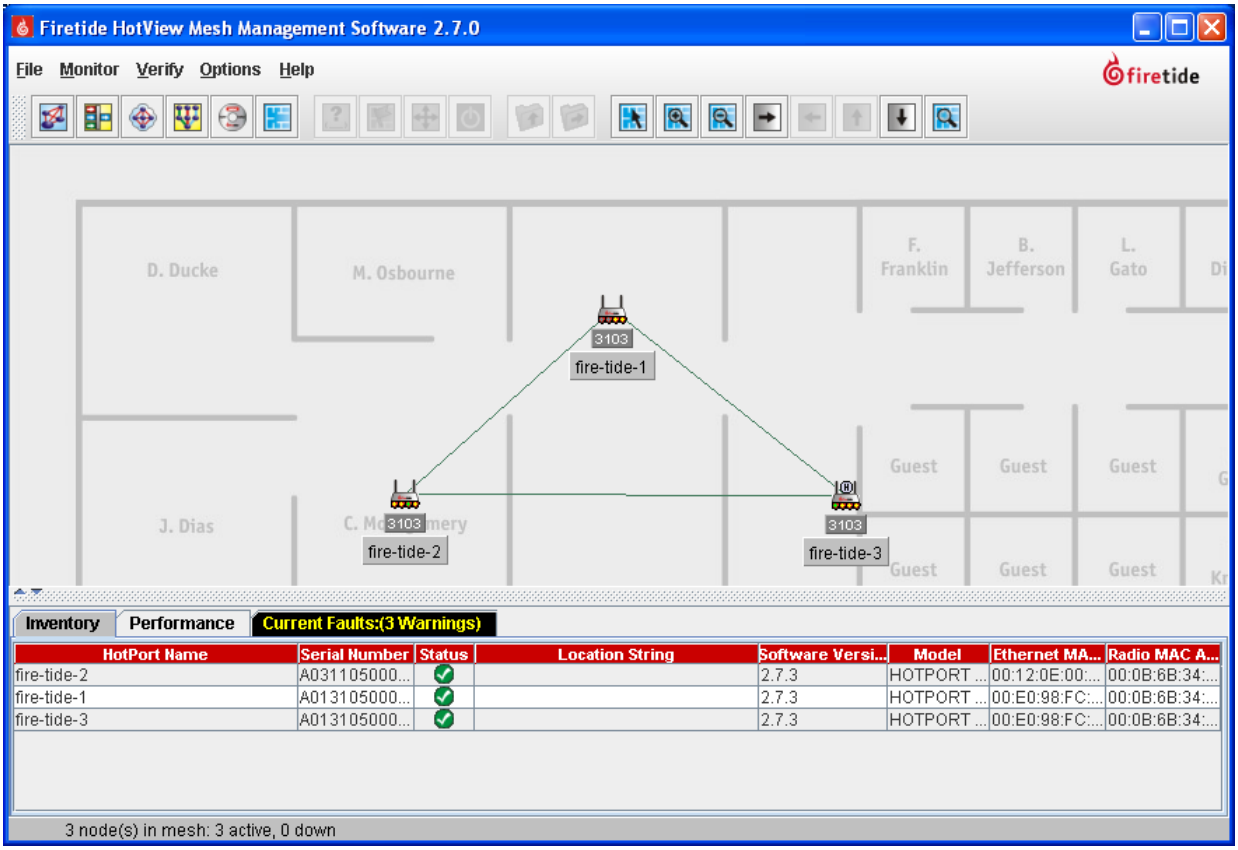
The meshed network is shown below. All three Mesh Nodes are linked together via a fully meshed topology. In order to easily identify each Mesh Node, users can rename by right click on the Mesh Node icon and select **Rename HotPort** to assign a new name. In this case, all three Mesh Nodes are renamed as shown in the picture below.



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Follow the steps below to assign a default gateway to each node.

- Click **File → Configure Mesh**.

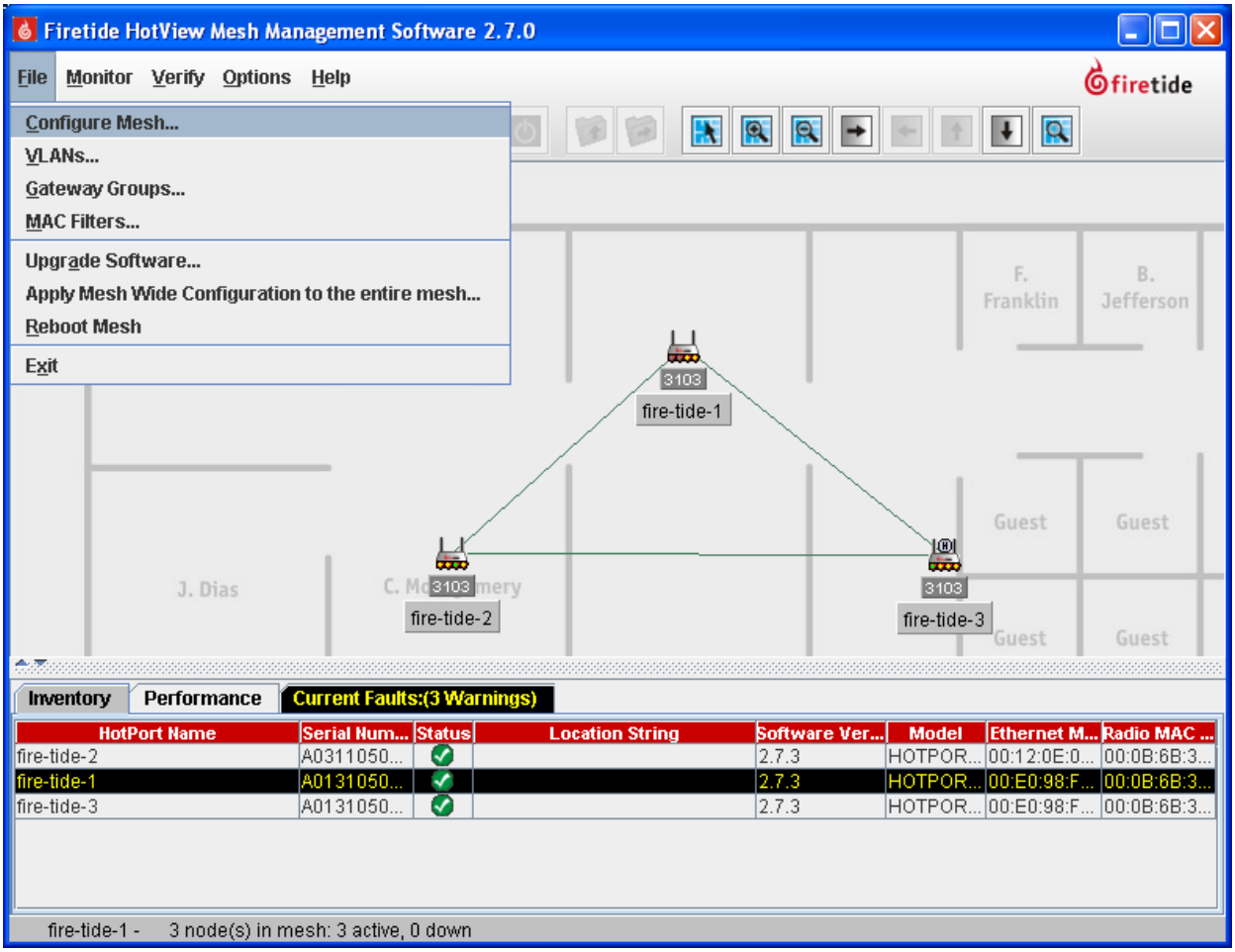

Figure 2: Global Configuration Menu for Mesh Network

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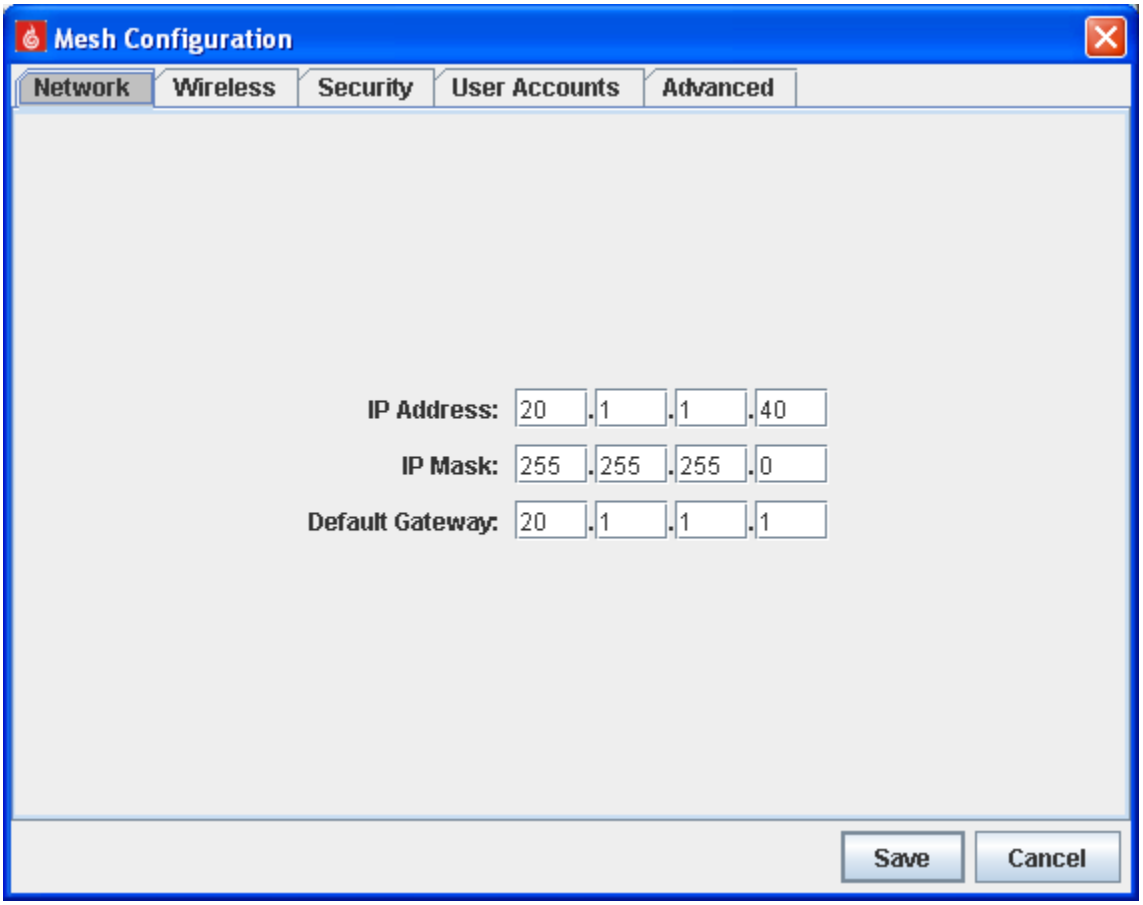
- Click the **Network** tab.
- Enter **20.1.1.1** for **Default Gateway**.
- Click **Save**.



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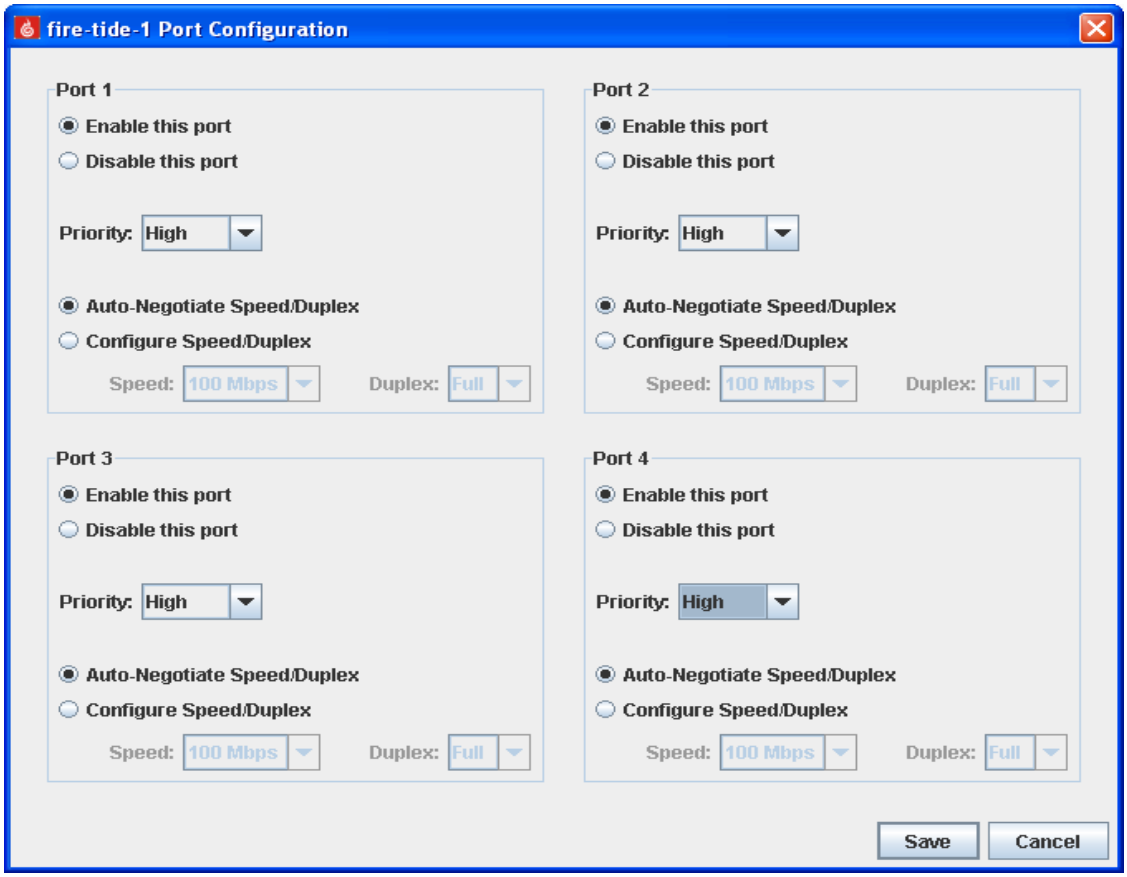
4.2. Configure Mesh Node Port Property

There are four 10/100 switch ports on each Mesh Node and each port can be configured as a 10 or 100 Mbps port with either half or full duplex. The default setting is auto-negotiate. To verify or change port settings, right click one of the Mesh Nodes icon from **Figure 2** and choose the port as shown below. Set the port priority to **High**.



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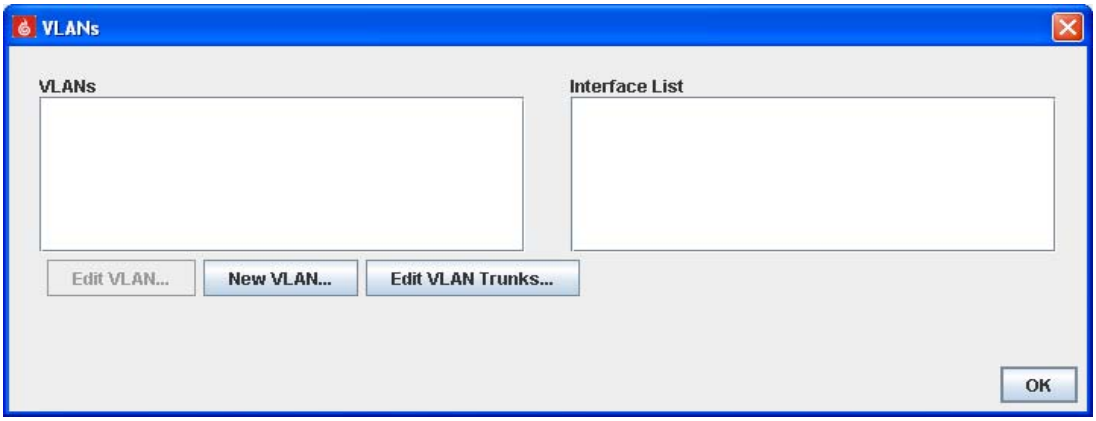
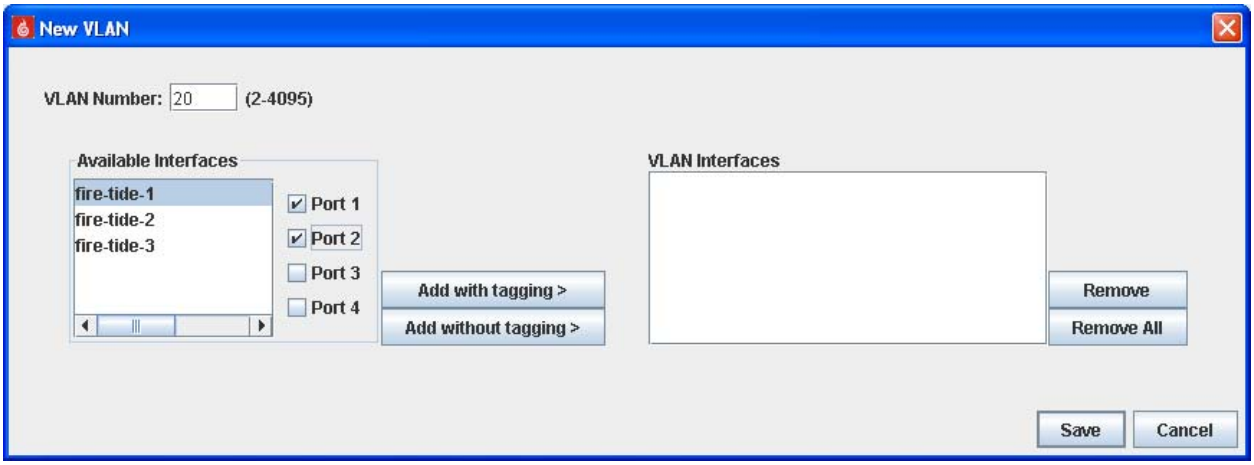
4.3. Configure VLAN and VLAN Trunking

As mentioned before, Firetide HotPort 3103 Mesh Nodes support VLAN and VLAN Trunking (Carry multiple VLAN in single switch port). A VLAN 20 is created in these Mesh Nodes to carry VoIP traffic. Follow the following steps to add VLAN 20 in the meshed network.

- From the Global Configuration Menu screen shown in **Figure 2**, Open **File → VLANs**.
- Select **New VLAN**.



- Enter **20** in the **VLAN Number** field.
- Select **fire-tide-1** and check **Port 1** and **Port 2** to add to VLAN 20.
- Click **Add without tagging** as shown below.



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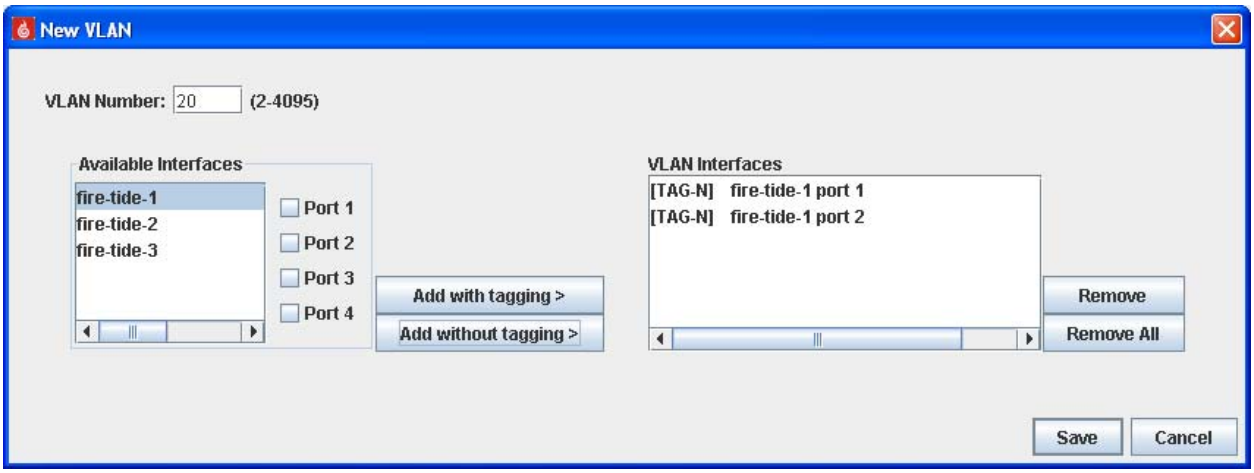
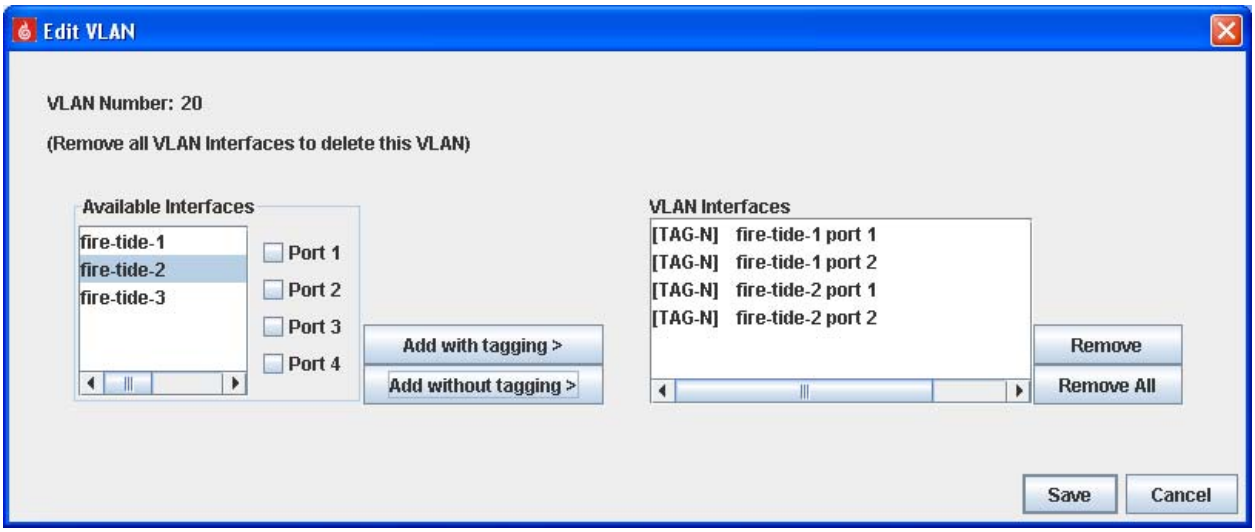


- Repeat the same procedure for fire-tide-2 to add ports 1 and 2 to VLAN 20.
- Click **Save** as shown below.



Note the differences between the configurations **add without tagging** and **add with tagging**.

- **Add without tagging** means that the Mesh Nodes will not alter the VLAN settings as the packets leave the switch port.
- **Add with tagging** means that the Mesh Nodes will tag the packet with VLAN ID, VLAN 20 in this case, as the packet leaves the switch port.

Port 3 of the device fire-tide-3 is connected to the Extreme Networks switch. In order to carry multiple VLANs, this port must be configured as a VLAN trunking port to match the port configuration on the Extreme Networks switch.

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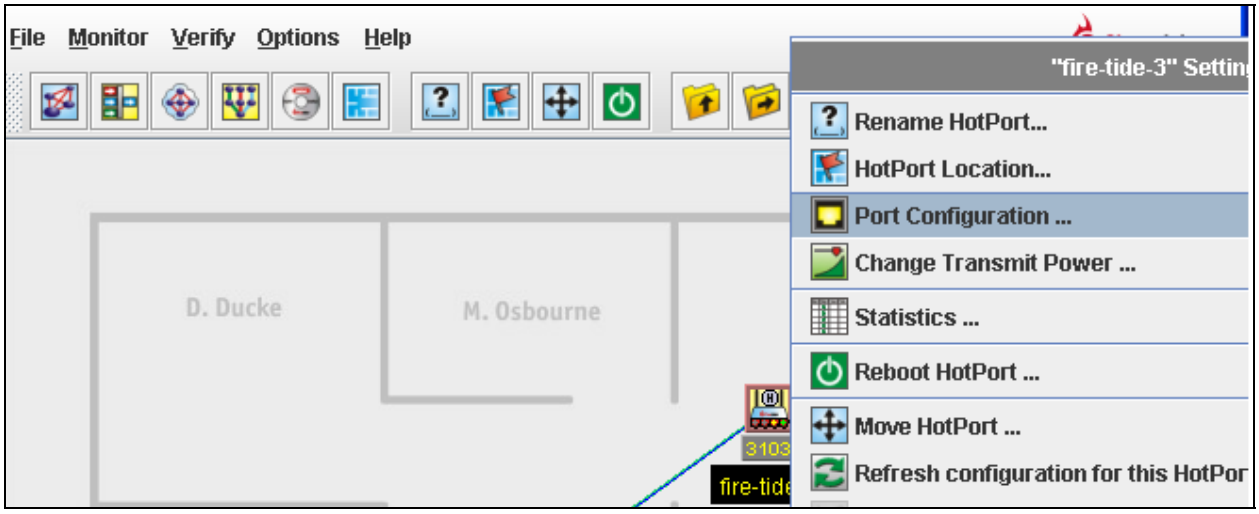
Due to the hardware limitations on the Mesh Nodes, port 1 and port 2 must be disabled in order for ports 3 and 4 to be used as trunking ports. Follow the steps below to configure VLAN trunking.

- Right click the **fire-tide-3** icon and select **Port Configuration**.



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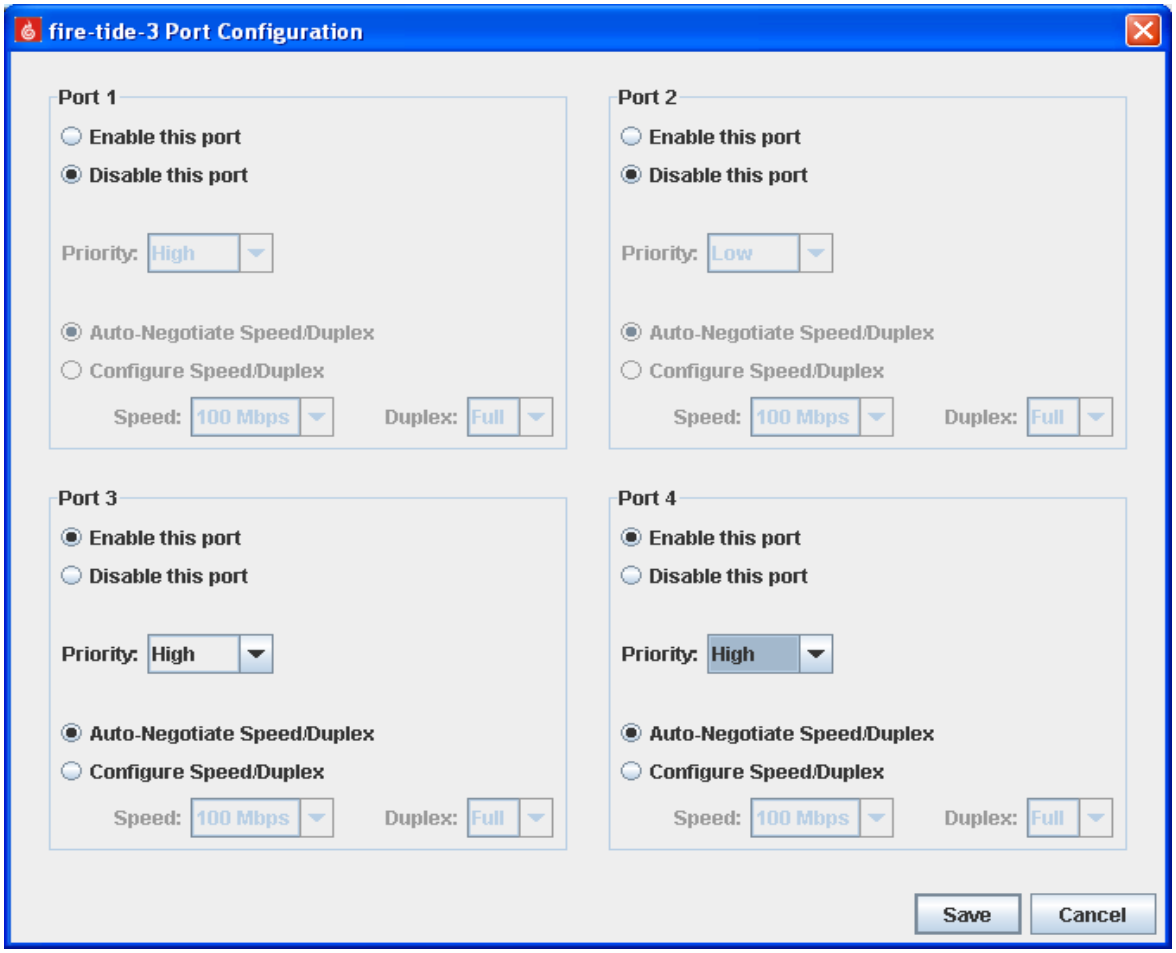
- Select **Disable this port** for both **Port 1** and **Port 2**.
- Click **Save**.



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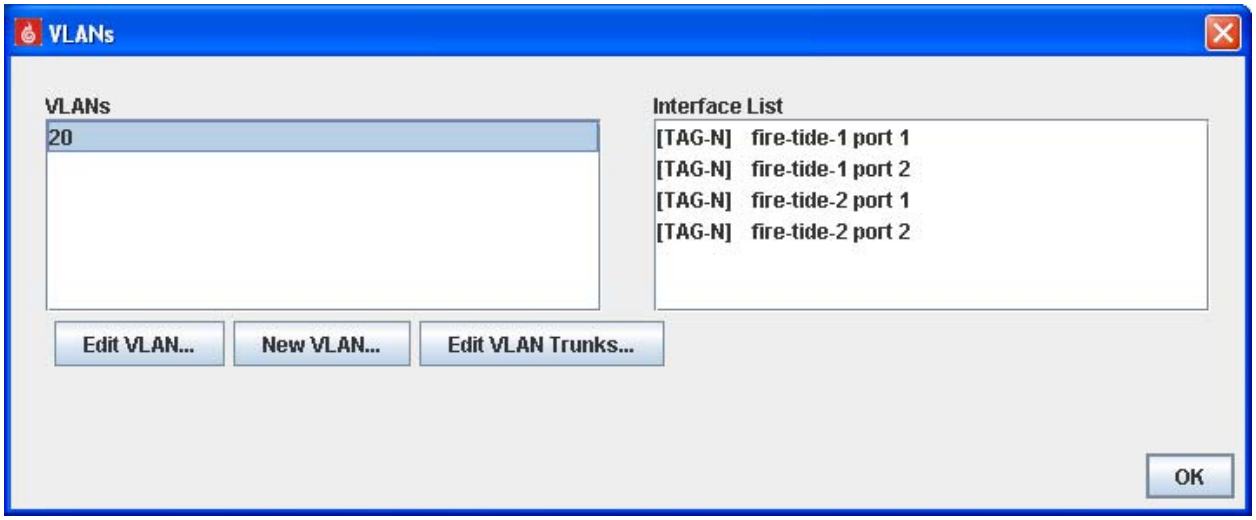
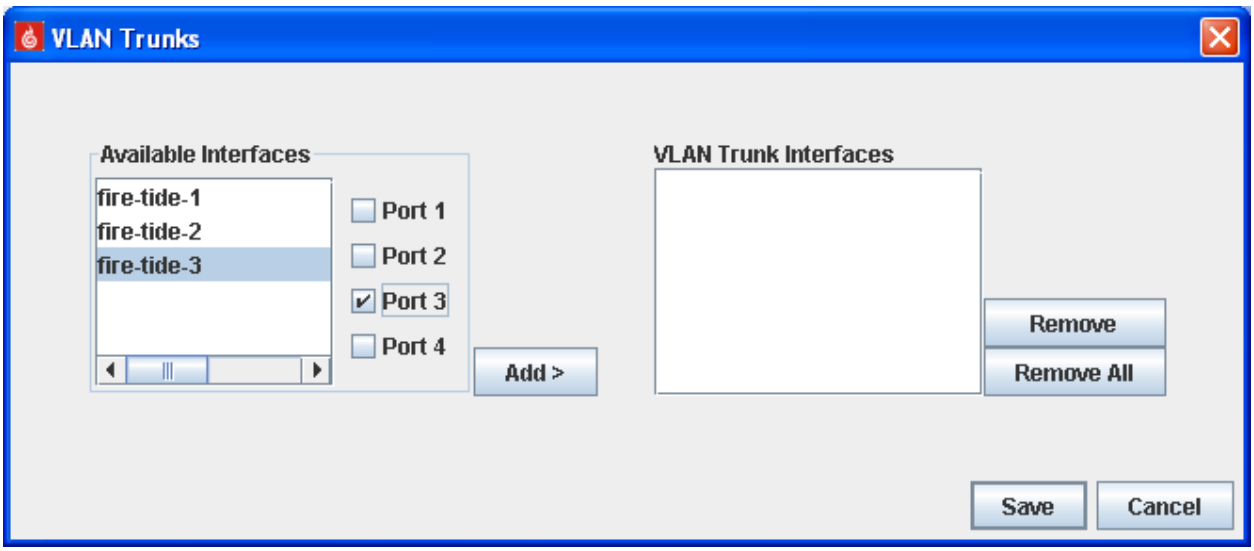
To configure Port 3 as a VLAN trunking port, proceed with the following steps.

- Open **File → VLANs** from the Global Configuration Menu screen shown in **Figure 2**.
- Select **Edit VLAN Trunks**.



- Highlight **fire-tide-3** and check **Port 3**.
- Click **Add**.
- Click **Save**.



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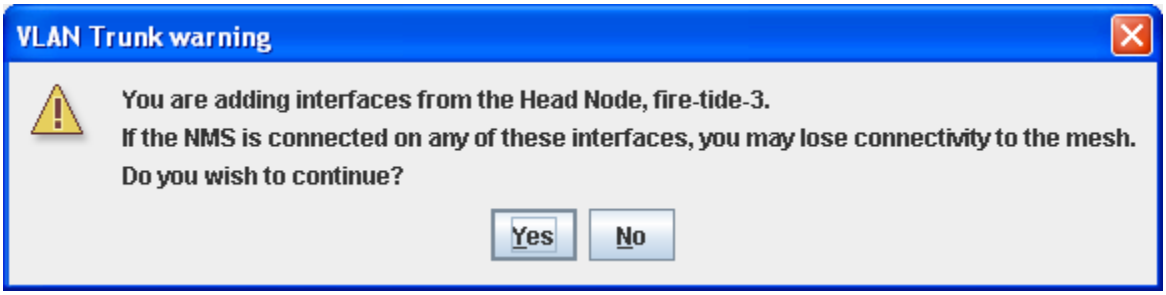
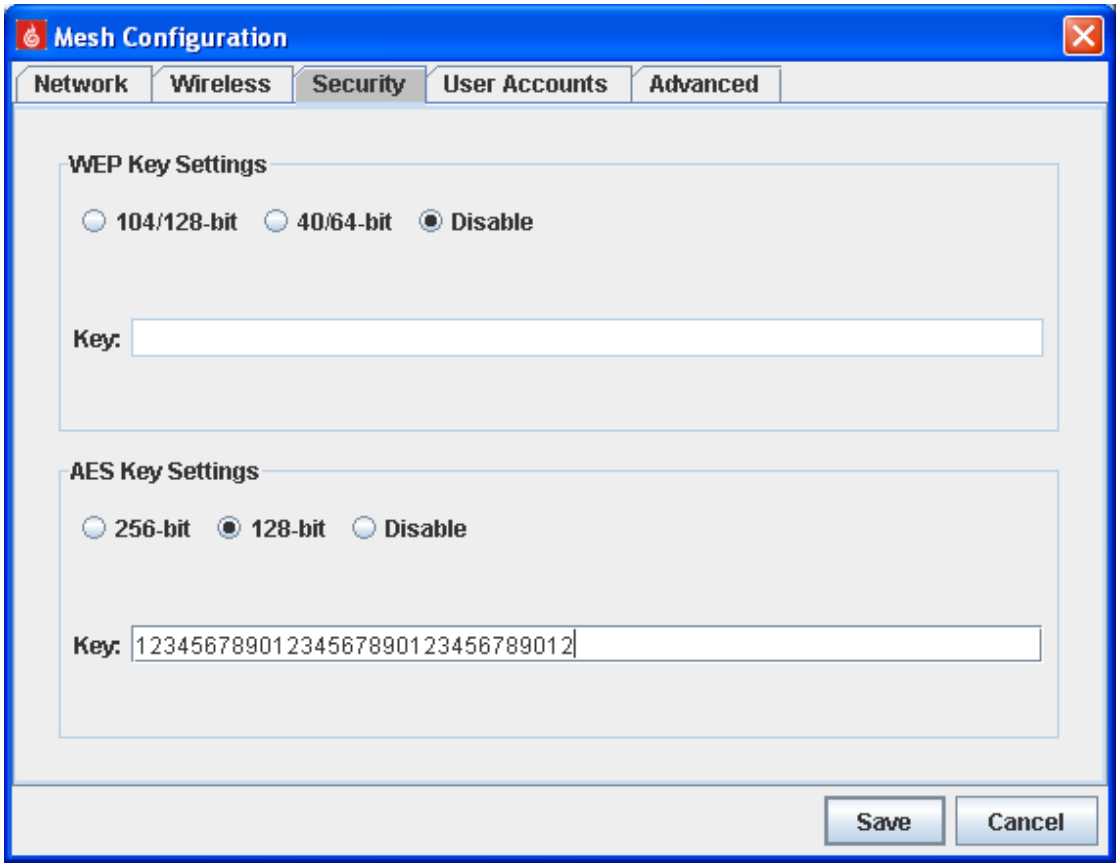
- Click **Yes** from VLAN Trunk warning display.


VLAN Trunk warning
You are adding interfaces from the Head Node, fire-tide-3.
If the NMS is connected on any of these interfaces, you may lose connectivity to the mesh.
Do you wish to continue?
Yes
No

4.4. Configure Security

The Firetide HotPort 3103 Mesh Nodes support two standard security settings in the meshed network. These security features support up to 104-bit WEP and up to 256-bit AES key encryption. In this configuration, a 128-bit AES key is used. To enable AES settings, click the **Security** tab, select **Disable** for **WEP Key Settings** and select **128-bit** for **AES Key Settings**. Enter 32 hex characters for **Key** and click **Save** when done.



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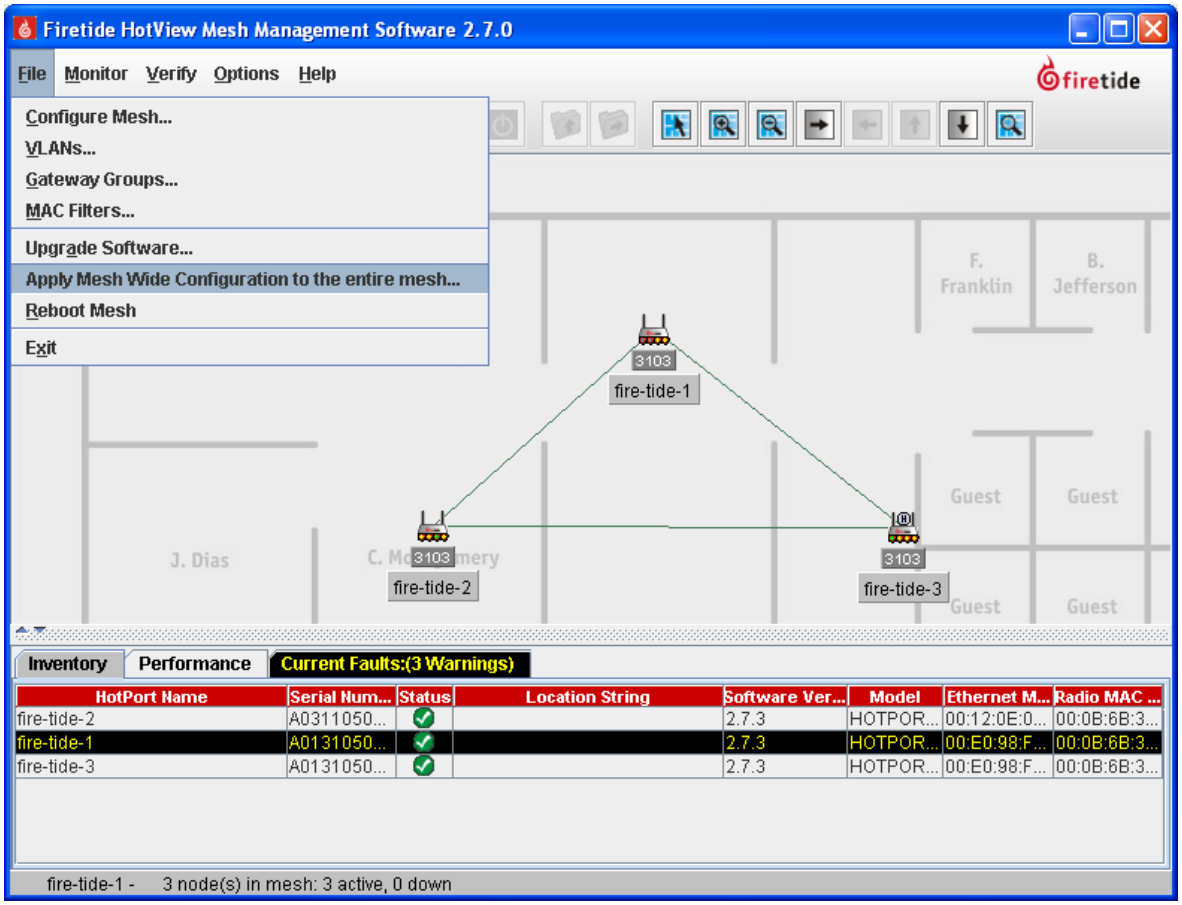
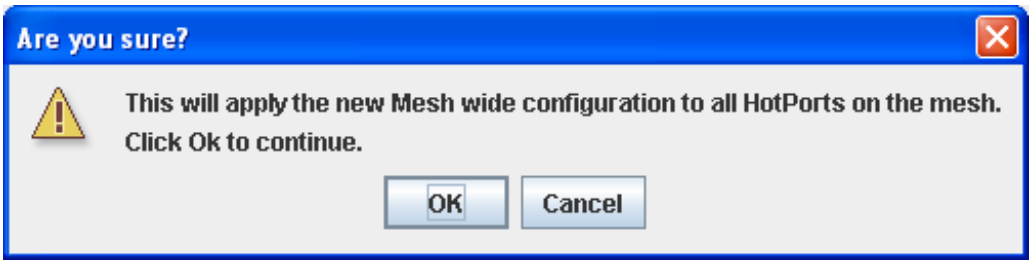
After completing the configuration on a single Mesh Node, the same configuration must be pushed out to the entire meshed network to update other nodes. Follow the steps below to update other nodes.

- Open **File → Apply Mesh Wide Configuration to the entire mesh**.



- Click **OK**.



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For Cisco Aironet 1200 and 3Com Access Point configuration, refer to the Application Notes listed in Section 9.

5. The Interoperability Compliance Testing

The interoperability compliance testing focused on verifying that Firetide HotPort 3103 Mesh Nodes support Avaya VoIP in a wireless meshed network.

5.1. General Test Approach

The general approach was to place calls among Avaya IP Wireless Telephones through the meshed network and verify successful call completion. The main objectives were to verify that:

- Mesh Nodes can automatically form a mesh network in wireless environment.
- Mesh Nodes support access points from multiple vendors and support the 802.11 a/b/g standard.
- Mesh Nodes support Avaya VoIP endpoints such as IP Softphones and IP Wireless Telephones in a wireless environment.
- Mesh Nodes support security such as WEP and AES.
- Mesh Nodes work with third party switches and support VLAN and 802.1Q tagging.
- The wireless mesh network supports Layer 2 roaming between access points.

5.2. Test Results

The test objectives of Section 5.1 were verified and all features were tested with satisfactory result.

6. Verification Steps

The following steps may be used to verify the configuration:

- From the HotView application, verify that all three Mesh Nodes discovered each other and formed a mesh.
- Ping the Avaya S8710 Media Server from wireless laptop 1 and verify that the wireless mesh network is able to provide connectivity to the wired network.
- Power up Avaya IP Wireless Telephones and verify that all Wireless Telephones can register with Avaya Communication Manager.
- Launch IP Softphone from the wireless laptop and verify that the IP Softphone can register with Avaya Communication Manager.
- Make a call between IP Wireless Telephone 1 and IP Wireless Telephone 2. Verify that the call is established.
- While the call is up, place a conference call to the Avaya 4620 IP Telephone on the wired network. Verify all three parties are in the conference call.
- Move the IP Wireless Telephone-1 into the range of the other access point. Verify that the call stays up.
- Enable AES security on all Mesh Nodes and verify that all traffic is encrypted.

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7. Support

For technical support on the Firetide products, consult the support pages at http://www.firetide.com or contact Firetide customer support at:

- Phone: 408-399-7771
- E-mail: info@firetide.com

8. Conclusion

These Application Notes describe a compliance-tested configuration comprised of Avaya Communication Manager, Avaya Wireless VoIP products (IP Wireless Telephones and IP Softphones) and the Firetide HotPort 3103 Mesh Nodes. The Firetide HotPort 3103 Mesh Nodes can provide Ethernet service to indoor location over a self-forming wireless mesh backbone. It can provide up to 25 Mbps throughput for high-bandwidth real time application such as Voice over IP in a wireless environment.

9. Additional References

Use the URL http://www.firetide.com/index.cfm?section=download316&contentID=316&siteID=1 to access these documents.

[1] HotView User Guide (Version 2.x).

[2] HotPort 3100 Series User Guide.

Use the URL http://www.avaya.com/gcm/master-usa/en-us/pillars/iptelephony/index.htm to access these Application Notes.

[3] Application Notes for Configuring 3Com Wireless LAN Access Point 8750 to Support Avaya Communication Manager, Avaya IP Wireless Telephones and Avaya IP Softphone - Issue 1.0.

[4] Configuring Cisco Aironet 1200 Access Point to Support Avaya Communication Manager, Avaya Wireless IP Telephones and Avaya IP Softphone - Issue 1.0.

[5] Application Notes for Configuring Netgear ProSafe Wireless Access Point WG302 to Support Avaya Communication Manager, Avaya IP Wireless Telephone and Avaya IP Softphone – Issue 1.0.

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